CLAIMS:

1. A surface-substrate for adherence of cells thereto comprising:

at least one micronail structure protruding from the surface, at least a region of said micronail having cellular-internalization promoting properties.

2. The surface-substrate of Claim 1, wherein the cellular-internalization promoting properties are obtained by coating at least the region of the micronail with cellular internalization- promoting moieties.

3. A surface-substrate according to Claim 1, wherein the micronail has a base portion and a head portion, and wherein the head portion has the cellular internalization promoting properties.

4. A surface-substrate according to Claim 3 wherein the head portion is coated with cellular-internalization promoting moieties

5. The surface-substrate of any one of Claims 2 to 4, wherein the cellular-internalization promoting moieties are selected from:

(a) hydrolytic enzymes that facilitate degradation of extracellular matrix;

(b) molecules that recognize plasma membrane components located on the external surface of the plasma membrane of cells;

(c) a combination of (a) and (b)

6. The surface-substrate of Claim 3, wherein the head portion is composed of or coated with a metal containing material.

7. The surface-substrate of Claim 6 wherein the metal is selected from: gold, copper, aluminum, platinum, silver, alloys of such metals or combinations of such metals.

8. The surface-substrate of Claim 5, wherein the hydrolytic enzyme is selected from polysaccharide-degrading enzymes, proteinases and lipid-degrading-enzymes.

9. The surface-substrate of Claim 8, wherein said hydrolytic enzyme is connected to the micronail through a biodegradable spacer molecule.

10. The surface-substrate of Claim 5, wherein the molecules that recognize plasma membrane components are selected from: ligands of plasma membrane receptors or receptor binding-parts of said ligands; receptors that recognize plasma membrane components; lectins that bind to plasma-membrane glycoproteins; antibodies that recognize plasma-membrane components or binding fragments thereof; integrins that recognize short linear amino acid sequences in ECM proteins; or combination of two or more of the above.

11. The surface-substrate of Claim 5, wherein the molecules that recognize plasma components are molecules which bind to polysaccharides that are part of proteoglycans in the ECM plasma membrane.

12. The surface-substrate of Claim 1 further comprising molecules that promote adhesion of cells.

13. The surface-substrate of Claim 4 and 12 wherein the molecules that promote adhesion of cells are present on at least one of the following: the base portion of the micronail, and the region surrounding the base portion.

14. The surface-substrate of Claim 12, wherein said adhesion molecules are in the form of a charged monolayer.

15. The surface-substrate of Claim 14, wherein said charged monolayer is a positively charged monolayer of polylysine, polyaniline and a like.

16. The surface-substrate of Claim 15, wherein said positively charged monolayer of polylysine, polyaniline and alike is assembled on a polystyrenesulfonate layer, said polystyrenesulfonate layer comprising anion units connected through a linker to the micronail.

17. A surface-substrate according to any one of Claims 1-16, adapted to form a cell-communicating part of an electrode.

18. A surface-substrate according to Claim 17, wherein the electrode is a gate electrode.

19. A surface-substrate according to Claim 17 or 18, wherein the base portion micronail is electrically isolated from its surrounding.

20. A surface-substrate according to Claim 17 or 18, wherein the micronail is electrically isolated from its surrounding.

21. A surface-substrate according to Claim 18, wherein the micronail is a conductive rod such as poly-silicon rod, which is an integral part of the poly-silicon gate electrode, and is insulated from the surrounding by a thin insulating layer.

22. A surface-substrate according to Claim 18, in the form of an integrated structure manufactured by lithography and etching techniques.

23. A surface-substrate according to Claim 19, wherein the base portion of the micronail is made of tungsten, and is isolated from the surrounding by a layer of silicon nitrade.

24. An electrode, comprising the surface-substrate of Claim 17.

25. An electrode according to claim 24 being a gate electrode.

26. An electrode according to claim 25 having a single micronail

27. An electrode according to claim 25 having a cluster of micronails.

28. An electrode according to claim 27, wherein the size of the cluster is smaller than the size of the cell to be in communication with the electrode.

29. An electrode according to Claim 24 or 25, coated with a layer of immobilized recognition molecules that, in the presence of cell-secreted components, catalyze a reaction that causes release of ions in a media surrounding said recognition molecule.

30. An electrode according to Claim 29, being a gate electrode.

31. A electrode according to Claim 29, wherein the distance between the recognition molecules and the surface of the coated gate is smaller than 15Å.

32. An electrode according to Claim 29 or 30, wherein the receptor molecules are enzymes or peptides.

33. An electrode according to Claim 32, wherein the recognition molecules catalyze said reaction in the presence of a cell-secreted component selected from acetylcholine, glutamate, GABA, serotonin, neurotransmitters and/or neuroendocrines, growth factors, cytokines.

34. An electrode according to Claim 33, wherein said recognition molecule is acetylcholine esterase.

35. An electrode according to Claims 30, wherein said gate-electrode is an ion sensitive gate.

36. An electrode according to Claim 35, wherein the ion-sensitive material is Aluminum Oxide (Al_2O_3), Silicon Nitride (Si_3N_4), Indium Tin Oxide (In_2O_3-Sn_2O_3), Silicon Oxide (SiO_2) or Tantalum Oxide (Ta_2O_5).

37. An electrode according to Claim 29 or 30, wherein the recognition molecules are immobilized via linker molecules that are covalently bound to at least one of the surface-substrate and the recognition molecules.

38. An electrode according to Claim 37, wherein said linker molecules are selected from conjugated or unconjugated aliphatic, aromatic or heteroaromatic molecules, having at least one functional group capable of covalently binding to said surface and at least one functional group capable of covalently binding to said recognition molecules.

39. A device for the detection of cell secreting components comprising an electrode arrangement having at least one electrode of claim 29 or 30.

40. A device for the detection of cell secreting components comprising at least one pair of source-drain electrodes and at least one gate-electrode of Claim 31 forming together at least one Field Effect Transistor (FET).

41. A device for electric communication with a cell comprising an electrode arrangement having at least one electrode of Claim 24 or 25.

42. A device for electrical communication with a cell comprising at least a pair of source-drain electrodes and at least one gate electrode as defined in Claim 25, thereby defining together at least one Field Effect Transistor (FET).

43. A device according to any one of Claims 41 or 42, wherein the electrical communication with the cell is achieved by a property selected from:

(a) detecting the presence of currents, or current changes in cells;

(b) detecting field potential or field potential change in cells;

(c) providing a current to cells;

(d) providing field potential to cells

(e) a combination of two or more of (a) to (d).